

AMENDMENTS TO THE CLAIMS

1-32. **(Cancelled)**

33. **(Currently Amended)** An optical disc device comprising:

a high frequency band processing circuit for removing low frequency components of signals outputted from photodetectors of an optical pickup, and subjecting frequency bands of the signals up to an RF signal frequency to AD conversion using a high-speed low-bit AD converter, and then generating various kinds of signals required for recording/playback of an optical disc by digital processing; and

a low frequency band processing circuit for removing high frequency components of the signals outputted from the photodetectors of the optical pickup, and subjecting the signals to AD conversion with a low-speed high-bit AD converter, and then generating various kinds of signals required for recording/playback of the optical disc by digital processing.

~~An optical disc device as defined in Claim 32 wherein~~

the said high frequency band processing circuit includes plural stages of HPFs having different cutoff frequencies which are in ascending order with respect to the signals outputted from the photodetectors of the pickup, and performs detection of plural signals required for recording/playback of the optical disc using signals of desired frequency bands which are outputted from the respective HPFs.

34. **(Currently Amended)** An optical disc device comprising:

a high frequency band processing circuit for removing low frequency components of signals outputted from photodetectors of an optical pickup, and subjecting frequency bands of the signals up to an RF signal frequency to AD conversion using a high-speed low-bit AD converter, and then generating various kinds of signals required for recording/playback of an optical disc by digital processing; and

a low frequency band processing circuit for removing high frequency components of the signals outputted from the photodetectors of the optical pickup, and subjecting the signals to AD conversion with a low-speed high-bit AD converter, and then generating various kinds of signals required for recording/playback of the optical disc by digital processing.

~~An optical disc device as defined in Claim 32 wherein~~

~~said~~the high frequency band processing circuit comprises:

first HPFs for removing DC components of the output signals from the respective photodetectors of the pickup and level fluctuations in low frequencies, ~~said~~the first HPFs being provided correspondingly to the output signals from the respective photodetectors;

second HPFs for receiving the output signals from the first HPFs, and removing frequencies which are higher than the cutoff frequency of the first HPFs and equal to and lower than a predetermined cutoff frequency;

AD converters for receiving the output signals from the second HPFs, and AD-converting the output signals from the second HPFs; and

third HPFs for receiving the digital signals outputted from the AD converters, and removing frequencies which are higher than the cutoff frequency of the second HPFs and equal to and lower than a predetermined cutoff frequency.

35. **(Currently Amended)** An optical disc device comprising:

a high frequency band processing circuit for removing low frequency components of signals outputted from photodetectors of an optical pickup, and subjecting frequency bands of the signals up to an RF signal frequency to AD conversion using a high-speed low-bit AD converter, and then generating various kinds of signals required for recording/playback of an optical disc by digital processing; and

a low frequency band processing circuit for removing high frequency components of the signals outputted from the photodetectors of the optical pickup, and subjecting the signals to AD conversion with a low-speed high-bit AD converter, and then generating various kinds of signals required for recording/playback of the optical disc by digital processing.

~~An optical disc device as defined in Claim 32 wherein~~

~~said~~the high frequency band processing circuit comprises:

second HPFs for removing frequencies which are equal to and lower than a predetermined cutoff frequency of the output signals from the respective photodetectors of the pickup, ~~said~~the second HPFs being provided correspondingly to the output signals from the respective photodetectors;

AD converters for receiving the output signals from the second HPFs, and AD-converting the output signals from the second HPFs; and

third HPFs for receiving the digital signals outputted from the AD converters, and removing frequencies which are higher than the cutoff frequency of the second HPFs and equal to and lower than a predetermined cutoff frequency.

36. **(Canceled)**

37. **(Currently Amended)** An optical disc device comprising:

first HPFs for removing DC components of output signals from photodetectors of a pickup and level fluctuations in low frequencies, saidthe first HPFs being provided correspondingly to the output signals from the respective photodetectors;

second HPFs for receiving the output signals from the first HPFs, and removing frequencies which are higher than the cutoff frequency of the first HPFs and equal to and lower than a predetermined cutoff frequency;

AD converters for receiving the output signals from the second HPFs, and AD-converting the output signals from the second HPFs; and

third HPFs for receiving the digital signals outputted from the AD converters, and removing frequencies which are higher than the cutoff frequency of the second HPFs and equal to and lower than a predetermined cutoff frequency.

38. **(Currently Amended)** An optical disc device comprising:

second HPFs for removing frequencies which are equal to and lower than a predetermined cutoff frequency of output signals from photodetectors of a pickup, saidthe second HPFs being provided correspondingly to the output signals from the respective photodetectors;

AD converters for receiving the output signals from the second HPFs, and AD-converting the output signals from the second HPFs; and

third HPFs for receiving the digital signals outputted from the AD converters, and removing frequencies which are higher than the cutoff frequency of the second HPFs and equal to and lower than a predetermined cutoff frequency.

39. **(Previously Presented)** An optical disc device as defined in any of Claims 34 and 37 wherein

the cutoff frequency of the first HPFs is a frequency that does not adversely affect jitter of the signals outputted from the respective photodetectors of the pickup.

40. **(Previously Presented)** An optical disc device as defined in any of Claims 34, 35, 37, and 38 further comprising a wobble signal generation circuit for generating a wobble signal using the digital signals outputted from the AD converters.

41. **(Currently Amended)** An optical disc device as defined in Claim 40 wherein

saidthe wobble signal generation circuit comprises:

a logic operation circuit for performing an arithmetic operation using the digital signals outputted from the AD converters to calculate a pushpull tracking error signal; and

a digital BPF for generating a wobble signal from the pushpull tracking error signal calculated by the logic operation circuit.

42. **(Previously Presented)** An optical disc device as defined in Claim 41 wherein

the cutoff frequency of the second HPFs is a frequency equal to or lower than a passband frequency of the digital BPF.

43. **(Currently Amended)** An optical disc device as defined in any of Claims 34, 35, 37, and 38 further comprising:

a pushpull track cross signal generation circuit for generating a pushpull track cross signal using the digital signals outputted from the AD converters;

wherein saidthe pushpull track cross signal generated by the pushpull track cross signal generation circuit is used as a track cross signal during high-speed seeking of an optical disc.

44. **(Currently Amended)** An optical disc device as defined in Claim 43 wherein
saidthe pushpull track cross signal generation circuit comprises:

a logic operation circuit for performing an arithmetic operation using the digital signals outputted from the AD converters to calculate a pushpull tracking error signal; and

a binarization circuit for binarizing the pushpull tracking error signal calculated by the logic operation circuit at a zerocross point to generate a pushpull track cross signal.

45. **(Previously Presented)** An optical disc device as defined in any of Claims 34, 35, 37, and 38 wherein

the cutoff frequency of the third HPFs is a frequency that enables removal of voltage level fluctuations, and removal of wobble components.

46. **(Previously Presented)** An optical disc device as defined in any of Claims 34, 35, 37, and 38 further comprising a phase difference tracking error signal detection circuit for generating a phase difference tracking error signal by digital processing using the digital signals outputted from the third HPFs.

47. **(Currently Amended)** An optical disc device comprising:

a high frequency band processing circuit for removing low frequency components of signals outputted from photodetectors of an optical pickup, and subjecting frequency bands of the signals up to an RF signal frequency to AD conversion using a high-speed low-bit AD converter, and then generating various kinds of signals required for recording/playback of an optical disc by digital processing; and

a low frequency band processing circuit for removing high frequency components of the signals outputted from the photodetectors of the optical pickup, and subjecting the signals to AD conversion with a low-speed high-bit AD converter, and then generating various kinds of signals required for recording/playback of the optical disc by digital processing.

An optical disc device as defined in Claim 32 wherein said the low frequency band processing circuit comprises comprising:

LPFs having a cutoff frequency equal to or lower than 1/2 of a sampling frequency, said the LPFs being provided correspondingly to signals outputted from photodetectors of a pickup;

a time-division AD converter for performing AD conversion of plural channels while successively selecting the output signals from the first LPFs;

a servo error signal generation circuit for performing a servo error signal generation operation by digital processing using the output from the time-division AD converter to generate a servo error signal; and

a servo operation circuit for performing a digital servo operation on the basis of the servo error signal generated by the servo error signal generation circuit to generate a driving signal for a driving system.

48. **(Canceled)**

49. **(Currently Amended)** An optical disc device comprising:

LPFs having a cutoff frequency equal to or lower than 1/2 of a sampling frequency, ~~said~~the LPFs being provided correspondingly to signals outputted from photodetectors of a pickup;

a time-division AD converter for performing AD conversion of plural channels while successively selecting the output signals from the first LPFs;

a servo error signal generation circuit for performing a servo error signal generation operation by digital processing using the output from the time-division AD converter to generate a servo error signal; and

a servo operation circuit for performing a digital servo operation on the basis of the servo error signal generated by the servo error signal generation circuit to generate a driving signal for a driving system;

wherein, when ~~said~~the servo error signal generation circuit performs the servo error signal generation operation using the signals from the photodetectors of the optical pickup receiving a main beam and signals from the photodetectors of the optical pickup receiving a sub beam,

~~said~~the servo error signal generation circuit controls the operation timing of arithmetic processing for the signals from the photodetectors receiving the main beam, which are outputted from the time-division AD converter, and the operation timing of arithmetic processing for the

signals from the photodetectors receiving the sub beam, which are outputted from the time-division AD converter, separately from each other, and

~~said~~the servo operation circuit performs the digital servo operation using the signals generated by the servo error signal generation circuit to generate a driving signal for a driving system.

50-62. (Canceled)